The Ant Fauna of the Oriental Region: An Overview (Hymenoptera, Formicidae)[1)]

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Abstract

The number of species of ants in the Oriental region are estimated more than 3,000, belonging to 135 genera of 9 subfamilies. A list of genera in the Oriental region is presented. At genus level, 34 of them are endemic to this region. The Oriental and the Australian regions share 82 genera in common, which represents about 49 % of total genera in both regions. This is the highest ratio of similarity comparing with other regions.

Current taxonomic works try to revise higher taxa based on extensive material. As a result, the number of genera has been reducing due to synonyms, but that of species has been increasing. In spite of the effort, there are still many genera left unstudied, so that 30 to 80 % of species collected from certain area cannot be identified. The present confusion comes from (1) isolate descriptions without appropriate comparison; (2) obscure definition of higher taxa; (3) unreliable "infraspecific variations". A good network of researchers will help to solve the present confusion.

Introduction

The present knowledge on the ant fauna in the Oriental region is quite obscure. The information on distribution of each ant in the region is incomplete and fragmental. According to Wilson (1987), approximately 8,800 species belonging to 303 genera of 11 subfamilies are described from the world to that time. The pie graph of Fig. 1, drawn from his data, shows one-fourth of the total number of species occurs in Asia. His estimation, however, leaves two points untouched. Firstly, the cited data in his estimation were not the same level of accuracy. As for the Asian ants, the figure was cited from the check list by Chapman & Capco (1951). This literature has been the only one covering this region but outdated. Indeed, many taxonomic changes and additions of new taxa have been made since that time. Thus the figure does not reflect the actual number. Secondly, this is not the estimation of the Oriental region.

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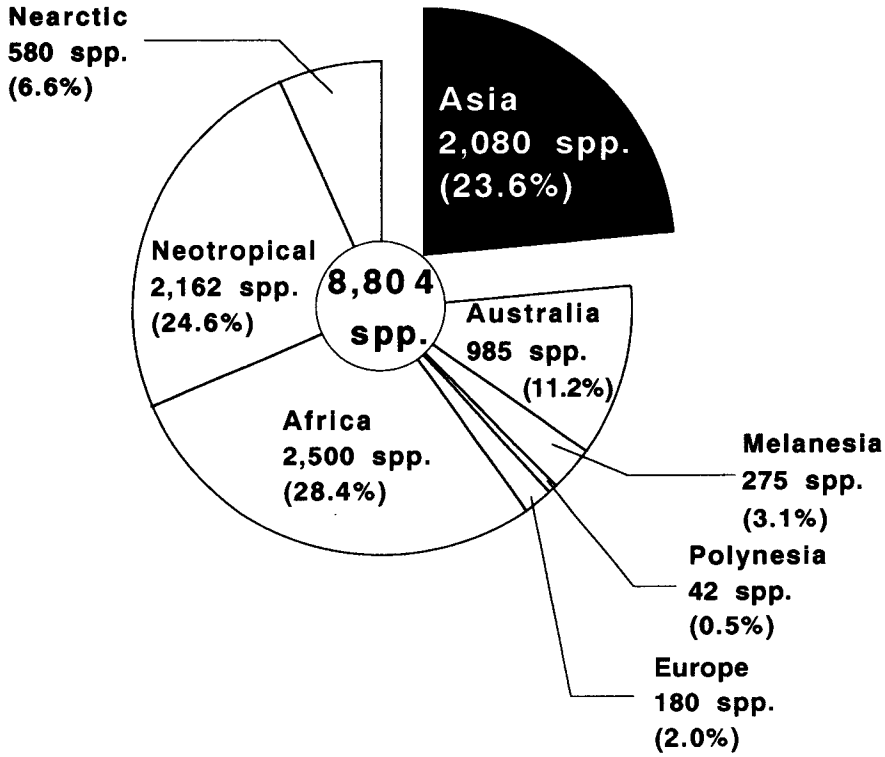

Fig. 1. Relative distribution of estimated numbers of species in the world (after Wilson, 1987).

In this paper, I would like to show the present situation of the ant taxonomy in the Oriental region. To begin with, the statistics of genera in the Oriental region is given with a discussion of biogeographical characteristics of the region. Then, a brief history of taxonomic activities and current state of the classification are overviewed. Finally, a prospect of ant taxonomy in this region is discussed.

The boundary of the Oriental region here follows tentatively that of Brown (1973). That is, the region consists of Indian subcontinent including Pakistan, south of the Pamir and the Himalayas, Myanmar (Burma), Indochinese and Malay Peninsulas, Indonesia including Malay Archipelago (the East Indies) to Timor and Sulawesi (Celebes), the Philippines, Taiwan, southern China from the Tsinling Mountains and the Tibetan Scarp, and southern Japan.

The subdivisions of the Oriental region are provisionally adopted from Lincoln & Boxshall (1987). The following four subregions are distinguished: the Indian subregion covering base of the Indian Peninsula; the Ceylonese subregion covering southern India and Sri Lanka; the Indo-Chinese subregion covering south of the Himalayas, Myanmar, Indochina, southern China, Taiwan and south of Japan; the Indo-Malayan subregion covering the Malay Peninsula, and SE Asian islands west of Weber's line. I admit that a detailed analysis for the exact limitation of the region and its subdivisions are necessary. This must be one of the future subject.

Genera of the Oriental region

At present, 135 genera of 9 subfamilies are recognized in the Oriental region. These are listed in the appendix. Since there have been no comprehensive check lists of this region yet, the exact number of species is still obscure, but would be estimated over 3,000.

A comparison of the number of genera among 7 zoogeographical regions is shown in Table 1. At genus level, the Oriental region has the highest number. Although several genera are questionable for their taxonomic status and they might be submerged as synonyms, it is supposed that there are still undescribed genera. This is supported by the fact that even within recent 5 years 12 genera have been described as new.

In terms of the similarity of generic composition, the Australian regions is the closest. The number of common genera in the Oriental and Australian regions is 82, which corresponds to 48.5 % of total number in both regions. On the other hand, the Palearctic region has a lower ratio of similarity (28.9 %), in spite of its close geographical position. Brown (1973) stated that the Oriental and Australian regions are not separated by a cold-temperature barrier and thus "the Oriental merges gradually into the Australian region within the tropics". Temperature factor would be applicable for a lower similarity between the Oriental and Palearctic regions, though the transition zone is rather broad in the boundary between these regions in their eastern part. An analysis of historical factor is incomplete because phylogenetic information is quite inadequate.

Table 1. Number of endemic genera in each zoogeographical region and that of common genera with the Oriental region. AU, Australian; ET, Ethiopian; MA, Malagasy; NA, Nearctic; NT, Neotropical; OR, Oriental; PA, Palearctic. Dash indicates absence of the subfamily, 0 means no endemic genera in the region.

	OR	AU	PA	ET	MA	NA	NT
Nothomyrmeciinae	—	1	—	—	—	—	—
Myrmeciinae	—	1	—	—	—	—	—
Ponerinae	1	1	1	12	1	0	7
Cerapachyinae	0	0	0	0	0	1	3
Dorylinae	0	0	0	0	—	—	—
Ecitoninae	—	—	—	—	—	0	2
Leptanillinae	5	0	0	1	—	—	0
Myrmicinae	19	10	8	11	3	1	35
Pseudomyrmecinae	0	0	—	0	0	0	1
Aneuretinae	1	—	—	—	—	—	—
Dolichoderinae	1	4	0	2	0	0	2
Formicinae	7	9	2	4	0	2	4
No. of endemic genn.	34	26	11	30	4	4	54
No. of genn.	135	116	61	96	37	69	123
% of endemic genn.	25.2	22.4	18.0	31.3	10.8	5.8	43.9
Common genn. with OR	—	82	44	61	30	38	44
Common Index*	—	48.5	28.9	35.9	21.1	22.8	20.7

$$* \text{ Common Index} = \frac{\text{no. of genn. in common}}{\text{total no. of genn. in both areas}} \times 100$$

Table 2. List of endemic genera to the Oriental region. O1, Indian subregion; O2, Ceylonese subregion; O3, Indo-Chinese subregion; O4, Indo-Malayan subregion. Asterisks show informal estimation based on personal communications with R.W. Taylor (on *Anomalomyrma* and *Protanilla*) and with M. Terayama (on *Trigonogaster*).

	spp.	Distribution					spp.	Distribution			
		O1	O2	O3	O4			O1	O2	O3	O4
PONERINAE						*Pentastruma*	2	−	−	+	−
Harpegnathos	5	−	+	+	+	*Proatta*	1	−	−	−	+
LEPTANILLINAE						*Rotastruma*	2	−	−	+	+
Anomalomyrma	*>2	−	−	+	+	*Secostruma*	1	−	−	−	+
Noonilla	1	−	−	−	+	*Stereomyrmex*	1	−	+	−	+
Phaulomyrma	1	−	−	−	+	*Tetheamyrma*	1	−	−	−	+
Protanilla	*>2	+	+	+	+	*Tricytarus*	1	−	−	−	+
Scyphodon	1	−	−	−	+	*Trigonogaster*	*>2	+	+	+	+
MYRMICINAE						**ANEURETINAE**					
Acanthomyrmex	11	−	+	+	+	*Aneuretus*	1	−	+	−	−
Anillomyrma	2	−	+	−	+	**DOLICHODERINAE**					
Asketogenys	1	−	−	−	+	*Loweriella*	1	−	−	−	+
Chimaeridris	2	−	−	−	+	**FORMICINAE**					
Dysedrognathus	1	−	−	−	+	*Bregmatomyrma*	1	−	−	−	+
Epelysidris	1	−	−	−	+	*Cladomyrma*	5	−	−	−	+
Indomyrma	1	−	+	−	−	*Forelophilus*	1	−	−	−	+
Ishakidris	1	−	−	−	+	*Gesomyrmex*	6	−	−	+	+
Kartidris	2	+	−	+	−	*Myrmoteras*	18	−	+	−	+
Lophomyrmex	?4	+	−	+	+	*Overbeckia*	1	−	−	−	+
Paratpula	9	−	+	−	+	*Pseudaphomomyrmex*	1	−	−	−	+

Endemic genera

Brown (1973) estimated 22 endemic genera in the Oriental region and referred to as the lowest endemism among the tropical regions. Now the genera are counted 34 (Table 2). This increase is mainly because of newly established genera, in addition to taxonomic changes, re-examinations of distributional data. Indeed 11 genera have been described since 1973. As a result, the number is comparable to that in the Ethiopian region. But the percentage of endemic genera is not so higher as in two other tropical regions, the Ethiopian and Neotropical regions. The ratio is almost same as in the Australian region.

The lower ratio of endemism might concern with the boundary between Sulawesi and New Guinea. If, ignoring the boundary, we consider the tropical and subtropical areas of the Oriental-Australian region, the ratio would become comparable with other two tropical regions.

Distribution patterns of endemic genera are shown in Table 2. Among 34 endemic genera, 2 genera, *Protanilla* and *Trigonogaster*, are distributed through the whole region. The Indo-Malayan subregion is most abundant in endemic genera. As many as 18 genera occur in this subregion exclusively, though several of them are seemed to be question in their taxonomic position. Other genera having more or less restricted distribution are *Indomyrma*,

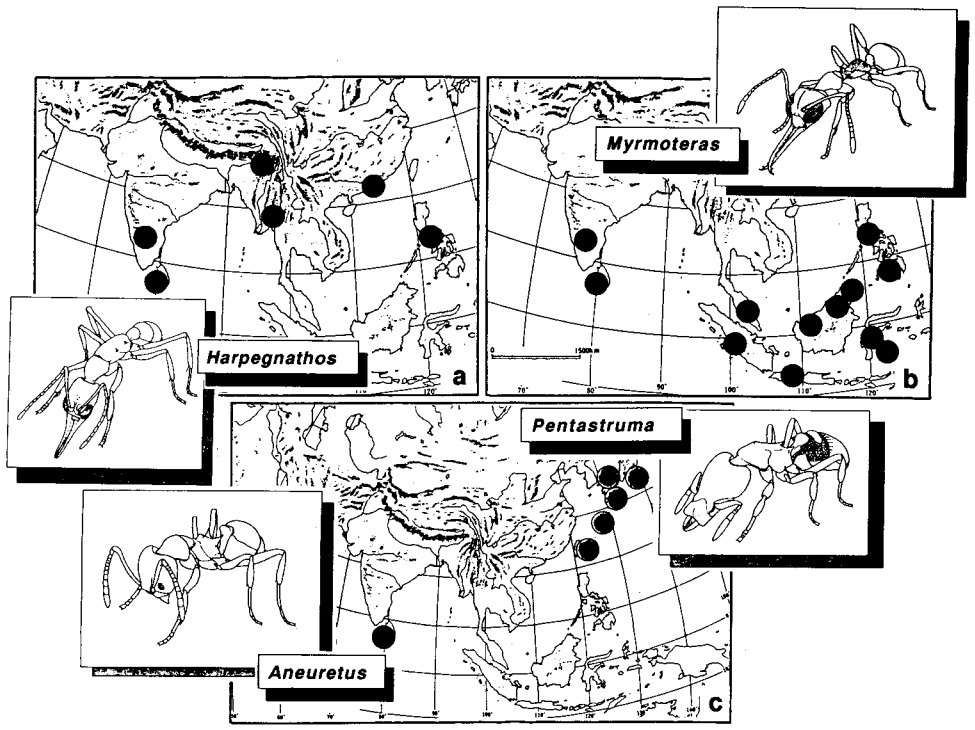

Fig. 2. Distribution patterns of some endemic genera to the Oriental region. a, *Harpegnathos*; b, *Myrmoteras*; c, *Aneuretus* and *Pentastruma*.

Pentastruma (Fig. 2c), *Stereomyrmex*, and *Aneuretus* (Fig. 2c). They are found in the Ceylonese subregion or Indo-Chinese subregion. No genera occur in the Indian subregion exclusively.

The distributions of other endemic genera are divided into three patterns. The first one includes the genera found mainly in the Indo-Chinese subregion with adjacent areas. Examples of this pattern are *Harpegnathos* (Fig. 2a), *Kartidris* and *Lophomyrmex*.

The second pattern is shown by the genera found mainly in southern India and SE Asian islands (O2+O4). This pattern is represented by *Anillomyrma, Acanthomyrmex, Paratpula* and *Myrmoteras* (Fig. 2b).

The third pattern includes the genera *Anomalomyma, Rotastruma* and *Gesomyrmex* which are found in eastern areas (O3+O4).

Genera occurred in the Oriental and other tropical regions

The genera only found both in the Oriental and Australian regions are many (21 of 82 shared genera occur in the both regions exclusively). As represented by the pattern of *Myopias* (Fig. 3b), many of them are found in a belt from southwestern India to northeastern

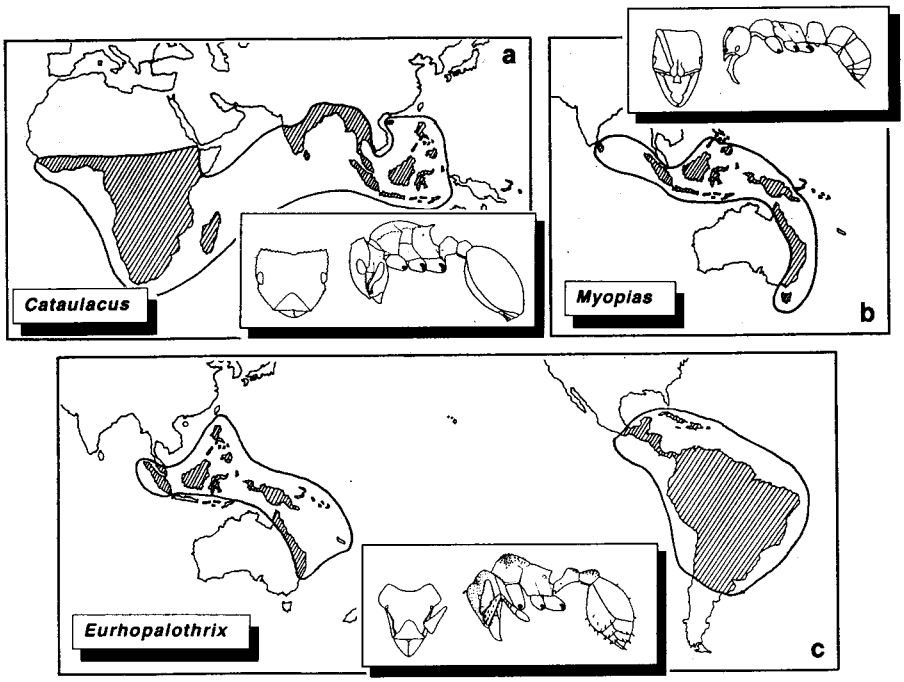

Fig. 3. Distribution patterns of some genera occurring in the Oriental and other tropical regions. a, *Cataulacus*; b, *Myopias*; c, *Eurhopalothrix*.

Australia. In particular, New Guinean ant fauna is important in considering the biogeography of both regions.

The genera found both in the Ethiopian (including the Malagasy) and the Oriental regions exclusively are counted 3: *Cataulacus* (Fig. 3a), *Myrmicaria, Paedalgus,* all of which belong to subfamily Myrmicinae but have phylogenetically no close relationships. The distributions of these genera show following two common patterns: 1) at least they occur in the Ceylonese subregion; 2) the species number is fewer to the eastward of the Oriental region. In terms of species number for these 3 genera, the Ethiopian region has more species than the Oriental region (46 : 17 in *Cataulacus*; 3:1 in *Paedalgus*) or at most the both have almost same number (9:8 in *Myrmicaria*), though the actual number of species might be increased because of the lack of recent revisionary works except for *Cataulacus* (Bolton 1974, 1982).

There are only two genera distributed both in the Oriental and Neotropical regions exclusively: *Belonopelta* of Ponerinae and *Perissomyrmex* of Myrmicinae. The species of the *Belonopelta* in the Oriental region were formerly treated under the genus *Emeryopone* which was synonimized by Baroni Urbani (1975). *Perissomyrmex* is said to be of the Oriental origin (Hölldobler & Wilson, 1990). Taking into the Australian region, a distribution pattern like *Eurhopalothrix* (Fig. 3c) would suggest a Gondowanic origin.

Detailed analysis of phylogenys among species is awaited, which will lead to hypotheses of dispersal/vicarience history on faunal relationships.

Current State of Classification

Taxonomic changes

Over the past few decades a considerable number of studies have been made on the taxonomy of the Oriental ants. To see the tendency of such taxonomic activities, we will make several historical comparisons.

Table 3 indicates the number of genera in Chapman & Capco (1951) and that in 1991. Though the statistics is for Asian ants, it is almost same tendency for the Oriental ants. Apparently the total number of genera in 1991 is reduced from that in 1951. During 40 years, 34 genera have been added as new, status raised, or new records. On the other hand, reduction of number mainly due to synonyms is counted 51, exceeding the number of additions. In particular the decrease is distinct in the subfamily Ponerinae. This is because the taxon has been intensively revised. The reclassification of this subfamily has been greatly contributed by Brown (1958, 1960, 1975, 1978, etc.). This tendency is also true for the subfamily Dolichoderinae (see the appendix where the number of genera decreased to 9), though the Table does not show the latest figure since the revisions were made quite recently (Shattuck, 1992a, b, c). In any case, once a taxonomic review is made, the number is tend to reduced. Is it true for species-level taxonomy?

A historical review of classification of the tribe Tetramoriini reveals the tendency of taxonomy more clearly. Fig. 4 shows changes in the numbers of taxa of the tribe in the Oriental region.

In 1922 when the framework of higher classification was established by Emery in *Genera*

Table 3. Comparison of number of Asian genera between 1951 and 1991. A1, newly described; A2, status raised; A3, new record; R1, synonyms; R2, removals due to incorrect locality; S, subfamily change.

	1951	addition			reduction		S	1991
		A1	A2	A3	R1	R2		
Ponerinae	37	0	5	0	16	1	-1	24
Cerapachyinae	4	0	0	1	3	0	+1	3
Leptanillinae	2	5	0	0	0	0	0	7
Dorylinae	2	0	0	0	0	0	0	2
Pseudomyrmecinae	1	0	0	0	0	0	0	1
Myrmicinae	71	18	0	2	19	2	0	70
Aneuretinae	—	0	0	0	0	0	+1	1
Dolichoderinae	14	0	2	1	3	0	-1	13
Formicinae	29	0	0	0	7	1	0	21
Total	160	23	7	4	48	4	—	142

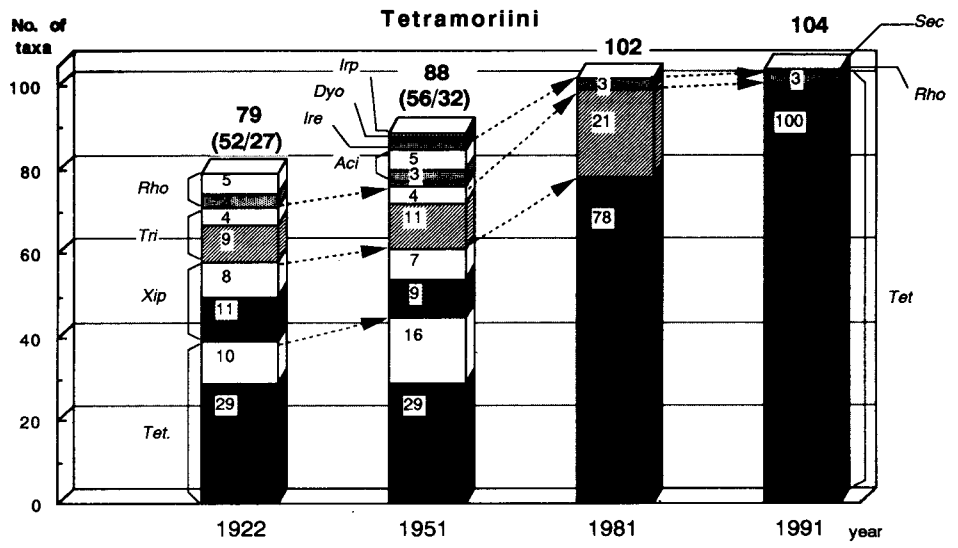

Fig. 4. Historical changes in the number of taxa of the tribe Tetramoriini in the Oriental region. Aci, *Acidomyrmex*; Dyo, *Dyomorium*; Ire, *Ireneela*; Irp, *Ireneopone*; Rho, *Rhopyromyrmex*; Sec, *Secostruma*; Tet, *Tetramorium*; Tri, *Triglyphothrix*; Xip, *Xiphomyrmex*. Unshaded areas show the number of infraspecific taxa.

Insectorum, the tribe includes 4 genera in the Oriental region. At that time 79 species and infraspecific forms had been described.

Almost thirty years after, by the publication of the check list of Chapmen & Capco (1951), 4 genera had been added: *Acidomyrmex* raised from a subgenus of *Rhoptromyrmex*, *Dyomorium* Donisthorpe, *Ireneela* Donisthorpe, and *Ireneopone* Donisthorpe. To that time, the tribe includes 88 species and infraspecific forms. It should be noted that the increase of taxa mainly attribute to infraspecific ones. In this duration, many taxonomic papers were presented but most of them were isolated descriptions.

Since the 1950's, revisionary works based on extensive material and detailed type comparisons have been increased. As for the classification of Tetramoriini, Brown (1964) revised *Rhoptromyrmex*, where *Acidomyrmex* was synonymized with it. In his revision of Solenopsidini and Pheidologetini, Ettershank (1966) synonymized *Dyomorium* with *Vollenhovia* (outside of the tribe). Most of the taxonomic changes in this duration were made by Bolton (1976, 1977). As a result, by 1981, the number of species-group taxa in the tribe was increased to 102, but that of genera became only 3.

Bolton further added *Triglyphothrix* into the synonymy of *Tetramorium* in 1985 and described a monotypic genus *Secostruma* as as new in 1986. Presently we have 3 genera comprising over 100 species of the tribe Tetramoriini.

From these examples, we can see the tendency of taxonomic changes as follows:

(1) The number of genera has been decreasing due to synonyms.

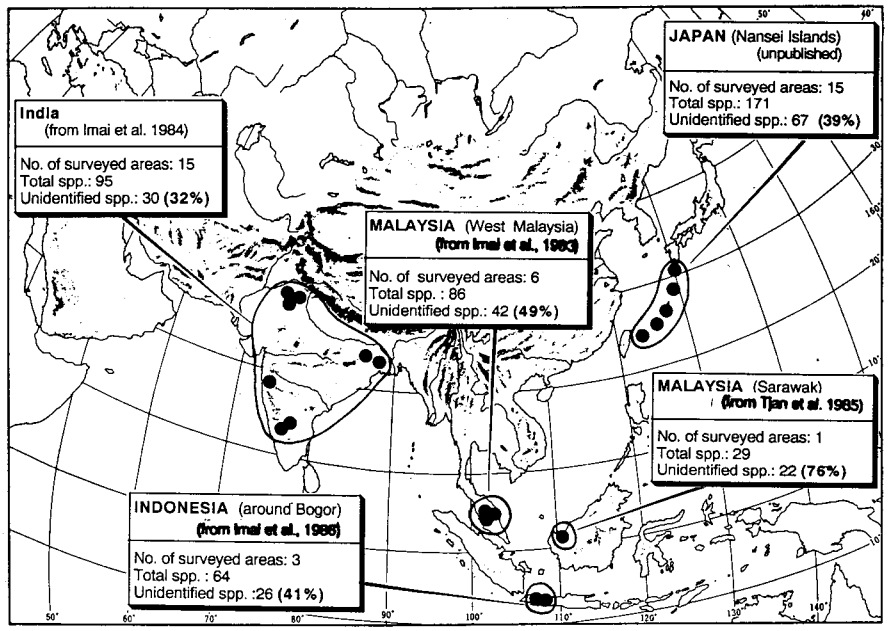

Fig. 5. Relative numbers of unidentified materials in various areas.

(2) The number of species has been increasing by finding new species.

(3) Infraspecific forms has been disappearing.

In addition to these taxonomic activities, the current studies of taxonomy also tend to focus on the phylogeny of higher taxa (e.g. Bolton, 1990b, 1990c; Ogata, 1990; Shattuck, 1992b; Ward, 1990).

Limit of identification

That is the case where the taxonomic revisions have been made recently. But such genera are limited (recent revisionary works are shown in the appendix). Most genera in the Oriental region have been left unstudied. Take several faunal reports for examples (Fig. 5).

In a series of karyological survey, Imai and his colleagues tried to identify their specimens exactly as possible. Despite the collaboration with American or European authorities of taxonomy, their material has high ratio of unidentified species (about 30 to 80 %), even it might include undescribed ones.

The situation is also true for the Nansei Islands of Japan. The islands are situated between Taiwan and Kyushu of Japan and are transition zone from the Oriental region to the Palearctic region in species composition. We can distinguished 170 species, but about 40 % of them are taxonomically unsolved (Ogata, unpublished).

The present situation of ant taxonomy in the Oriental region is simply expressed by the word "Oriental Chaos" (Brown, pers. com). Taxonomic studies before 1950's concentrate on

descriptions of local faunas. Have such efforts contributed the development of ant taxonomy? Brown (1955) stated the history as follows:

> "The years following 1910 saw many specialists joined the rush to describe ants... Taken generally, their work is very disappointing...."

Indeed it is often difficult to identify the species without reference to the types because most of the descriptions and keys are poor and useless. Furthermore, finding the type materials itself is sometimes difficult because they are scattered in various institutes of American or European countries. As seen in the previous section, the confusion comes from: (1) isolate descriptions without appropriate comparison; (2) obscure definition of higher taxa; (3) unreliable "infra-specific variations".

This state is not restricted to the ants of the Oriental region (see Taylor, 1983 for Australia), but unlike the Australian National Insect Collection there are few institutes having comprehensive collections in Asian countries.

Prospect

Wilson (1987) supposed that 20,000 or more species of ants exist in the world, and that the number or genera will reach about 350. The survey and synthesis of the Oriental region are on going by many taxonomists. Year by year, new knowledge is adding. But since the family Formicidae is such a huge group, it would need time to construct a systematized information. On the other hand, in a recent crisis of biodiversity, describing a local fauna, in particular that in the tropics, becomes a urgent and important subject (Wilson, 1988). But considering the previous history which caused the present confusion, we should not only concentrate on a local fauna but have comprehensive view. Then, is there any effective way to solve the present situation?

As illustrated by Taylor (1983), there are several levels between species in nature and species taxonomically understood. To increase species taxonomically understood, a rate of taxonomic activity should be advanced. Information networks will play an important role in this rate. In case of Japan, the Myrmecological Society of Japan have published a series of identification manuals (1988-1992). The books cover all the distinguishable species, including ones not formally named or "problematical species". This is tentative treatment, but we can distinguish the species taxonomically understood from ones in question which will be treated in future revisionary works with extensive material and accumulated information. In carrying the project, the networks of myrmecologists has been quite useful and now the knowledge on the taxonomy of Japanese ants is held in common by more researchers at least in Japan.

The Oriental region, like other tropical regions, consists of many developing countries. This means that there are still many areas where scientific survey is difficult due to political

reasons or ill transportation system. Using a good networks of world researchers can avoid further confusion and accelerate the rate of taxonomic activity.

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Appendix: List of genera in the Oriental region

This list is based on a table by Hölldobler & Wilson (1990) with a modification of later taxonomic changes. Genera are listed alphabetically within each subfamily. New additions since Chapman & Capco's check list (1951) are shown by asterisks. Numbers are put in presently recognizable names in the Oriental regions. Bold face genera show the endemic to the Oriental region. Italics show junior synonyms or removals from the region. Arrows indicate correct regions where the excluded genus is occurred. Abbreviations of zoogeographical regions are as in Table 1 (small letters of those indicate the region introduced).

PONERINAE

1.	Amblyopone Erichson 1842	AU, ET, NA, NT, OR, PA	Brown, 1960
2.	Anochetus Mayr 1861	AU, ET, NT, OR	Brown, 1978
*3.	Belonopelta Mayr 1870	NT, OR	Baroni Urbani, 1975a
	Bothroponera Mayr 1862	=Pachycondyla	
*4.	Brachyponera Emery 1901	AU, ET, OR	
5.	Centromyrmex Mayr 186	ET, NT, OR	
	Chalcoponera Emery 1897	=Rhytidoponera	
6.	Cryptopone Emery 1892	AU, ET, NA, NT, OR, PA	
7.	Diacamma Mayr 1862	AU, OR	
8.	Discothyrea Roger 1863	AU, ET, NA, NT, OR	Brown, 1958
9.	Ectomomyrmex Mayr 1867	AU, OR	
	Emeryopone Forel 1912	=Belonopelta	
	Euponera Forel 1891	→[MA]	
	Examblyopone Donisthopre 1949	=Prionopelta	
*10.	Gnamptogenys Roger 1863	AU, NA, NT, OR	Brown, 1958

11.	**Harpegnathos** Jerdon 1851	OR	
*12.	Hypoponera Santschi 1938	AU, ET, MA, NA, NT, OR, PA	Taylor, 1967
13.	Leptogenys Roger 1861	AU, ET, MA, NA, NT, OR, PA	
	Microbolbos Donisthorpe 1948	=Leptogenys	
14.	Myopias Roger 1861	AU, OR	
15.	Myopopone Roger 1861	AU, OR	Brown, 1960
16.	Mystrium Roger 1862	AU, ET, MA, OR	Brown, 1960
17.	Odontomachus Latreille 1804	AU, ET, MA, NA, NT, OR, PA	Brown, 1976
18.	Odontoponera Mayr 1862	AU, OR	
19.	Pachycondyla F.Smith 1858	AU, ET, MA, NA, NT, OR, PA	[incl. Bothroponera]
20.	Platythyrea Roger 1863	AU, ET, NA, NT, OR	Brown, 1975
21.	Ponera Latreille 1804	AU, ET, NA, NT, OR, PA	Taylor, 1967
22.	Prionopelta Mayr 1866	AU, ET, MA, NA, NT, OR	Brown, 1960
23.	Probolomyrmex Mayr 1901	AU, ET, NT, OR	Brown, 1975
24.	Proceratium Roger 1863	AU, ET, MA, NA, NT, OR, PA	Brown, 1958
	Prodiscothyrea Wheeler 1916	=Discothyrea	
	Pseudocryptopone Wheeler 1933	=Ponera	
	Pseudoneoponera Donisthorpe 1943	=Pachycondyla	
	Pseudoponera Emery 1901	=Pachycondyla	
	Renea Donisthorpe 1947	=Prionopelta	
	Rhopalopone Emery 1897	=Gnamptogenys	
25.	Rhytidoponera Mayr 1862	AU, OR	Brown, 1958; Ward, 1980
	Selenopone Wheeler 1933	=Ponera	
	Stictoponera Mayr 1887	=Gnamptogenys	
	Stigmatomma Roger 1859	=Amblyopone	
	Sysphincta Roger 1863	=Proceratium	
26.	Trachymesopus Emery 1911	AU, ET, OR	
	Trapeziopelta Mayr 1862	=Myopias	

CERAPACHYINAE [For the status of the subfamily and phylogenetic relationship, see Bolton (1990a, c)]

27.	Cerapachys F.Smith 1857	AU,ET, MA, NA, NT, OR, PA	Brown, 1975
	Eusphinctus Emery 1893	=Sphinctomyrmex	
	Lioponera Mayr 1878	=Cerapachys	
	Phyracaces Emery 1902	=Cerapachys	
28.	Simopone Forel 1891	AU, ET, MA, OR	Brown, 1975
*29.	Sphinctomyrmex Mayr 1866	AU, ET, NT, OR	Brown, 1975

LEPTANILLINAE [For the higher classification of the subfamily , see Bolton (1990b)]

*30.	**Anomalomyrma** Taylor in Bolton 1990	OR	
31.	Leptanilla Emery 1870	AU, ET, OR, PA	Baroni Urbani, 1977c
*32.	**Noonilla** Petersen 1968	OR	Baroni Urbani, 1977c
33.	**Phaulomyrma** Wheeler & Wheeler 1930	OR	Baroni Urbani, 1977c
*34.	**Protanilla** Taylor in Bolton 1990	OR	
*35.	**Scyphodon** Brues 1925	OR	Baroni Urbani, 1977c
*36.	Yavnella Kugler 1986	OR, PA	

DORYLINAE [Bolton (1990c) established the subfamily Aenictinae comprising sole genus *Aenictus*]

37.	Aenictus Shuckard 1840	AU, ET, OR	Wilson, 1964
38.	Dorylus Fabricius 1793	ET, OR, PA	Wilson, 1964

PSEUDOMYRMECINAE

39.	Tetraponera F.Smith 1852	AU, MA, OR, PA	Ward, 1990

MYRMICINAE

	Acalama M. Smith 1948	=Vollenhovia	
40.	**Acanthomyrmex** Emery 1892	OR	Moffett, 1986
	Acidomyrmex Emery 1915	=Rhoptromyrmex	
41.	Adelomyrmex Emery 1897	AU, NT, OR	
	Aeromyrma Forel 1891	=Oligomyrmex	
	Amauromyrmex Wheeler 1929	=Pheidologeton	
	Ancyridis Wheeler 1935	→ [AU: PNG]	
	Aneleus Emery 1900	=Oligomyrmex	
42.	**Anillomyrma** Emery 1913	OR	Bolton, 1987
43.	Aphaenogaster Mayr 1853	AU, MA, NA, NT, OR, PA	

	Aratromyrmex Stitz 1938	=Liomyrmex	
*44.	**Asketogenys** Brown, 1972	OR	
	Atopula Emery 1912	=Tetramorium	
	Atta Fabricius 1804	→ [NA, NT]	
45.	Calyptomyrmex Emery 1887	AU, ET, OR	Baroni Urbani, 1975b; Bolton, 1981
46.	Cardiocondyla Emery 1869	AU, ET, MA, na, nt, OR, PA	Bolton, 1982
47.	Carebara Westwood 1894	ET, NT, OR	
48.	Cataulacus F.Smith 1853	ET, MA, OR	Bolton, 1974, 1982
	Ceratopheidole Pergande 1859	=Pheidole	
*49.	**Chimaeridris** Wilson 1989	OR	
	Conothorax Karawajew 1935	=Pheidole	
50.	Crematogaster Lund 1831	AU, ET, MA, NA, NT, OR, PA	
*51.	Dacetinops Brown & Wilson 1957	AU, OR	Taylor, 1985
52.	Dilobocondyla Santschi 1910	AU, OR	
	Dodous Donisthorpe 1946	=Pristomyrmex	
	Dyomorium Donisthorpe 1947	=Vollenhovia	
*53.	**Dysedrognathus** Taylor 1968	OR	
	Eneria Donisthorpe 1948	=Strumigenys	
*54.	**Epelysidris** Bolton 1987	OR	
55.	Epitritus Emery 1869	ET, OR, PA	
	Epopostruma Forel 1865	→ [AU]	
*56.	Eurhopalothrix Brown & Kempf 1961	AU, NA, NT, OR	Taylor, 1990a
	Gauromyrmex Menozzi 1933	=Vollenhovia	
*57.	Glamyromyrmex Wheeler 1915	AU, ET, NT, OR	
*58.	**Indomyrma** Brown 1985	OR	
	Ireneela Donisthorpe 1941	=Rhoptromyrmex	
	Ireneidris Donisthorpe 1943	=Monomorium	
	Ireneopone Donisthorpe 1946	→ [MA]	
	Ischnomyrmex Mayr 1862	=Pheidole	
*59.	**Ishakidris** Bolton 1984	OR	
*60.	**Kartidris** Bolton 1991	OR	
*61.	Kyidris Brown 1949	AU, OR	Wilson & Brown, 1956
62.	Leptothorax Mayr 1855	AU, ET, MA, NA, NT, OR, PA	Bolton, 1982
63.	Liomyrmex Mayr 1865	AU, OR	

64.	**Lophomyrmex** Emery 1892	OR	
65.	Lordomyrma Emery 1897	AU, OR	
*66.	Mayriella Forel 1902	AU, OR	Baroni Urbani, 1977a
67.	Meranoplus F.Smith 1853	AU, ET, MA, OR	Bolton, 1981
68.	Messor Forel 1890	ET, NA, OR, PA	Bolton, 1982
69.	Metapone Forel 1900	AU, MA, OR	
70.	Monomorium Mayr 1855	AU, ET, MA, NA, NT, OR	Etthershank, 1966; Bolton, 1987
71.	Myrmecina Curtis 1829	AU, NA, NT, OR, PA	
72.	Myrmica Latreille 1804	NA, OR, PA	
73.	Myrmicaria Saunders 1841	ET, OR	
74.	Oligomyrmex Mayr 1867	AU, ET, MA, OR, PA	Etthershank, 1966
	Orectognathus F. Smith 1853	→ [AU]	
75.	Paedalgus Forel 1911	ET, OR	
76.	**Paratopula** Wheeler 1919	OR	Bolton, 1988a
77.	**Pentastruma** Forel 1912	OR	Brown & Boisvert, 1978
*78.	Perissomyrmex M.Smith 1947	NT, OR	
79.	Pheidole Westwood 1840	AU, ET, MA, NA, NT, OR, PA	
80.	Pheidologeton Mayr 1862	AU, ET, OR	Etthershank, 1966
81.	Podomyrma F.Smith 1859	AU, OR	
82.	Pristomyrmex Mayr 1866	AU, ET, MA, OR	Taylor, 1965; Bolton, 1981
83.	**Proatta** Forel 1912	OR	
*84.	Quadristruma Brown 1949	AU, ET, or	Bolton, 1983
85.	Rhopalomastix Forel 1900	AU, OR	Taylor, 1991
	Rhopalothrix Mayr 1870	→ [AU, NT]	
86.	Rhoptromyrmex Mayr 1901	AU, ET, OR	Bolton, 1986
	Rogeria Emery 1894	→ [AU, NA, NT]	
87.	Romblonella Wheeler 1935	AU, OR	Taylor, 1990b
*88.	**Rotastruma** Bolton 1991	OR	
*89.	**Secostruma** Bolton 1988	OR	
90.	Smithistruma Brown 1948	ET, MA, NA, NT, OR, PA	
	Solenomyrma Karawajew 1935	=Vollenhovia	
91.	Solenopsis Westwood 1840	AU, ET, NA, NT OR, PA	Etthershank, 1966; Bolton, 1987
92.	Stenamma Westwood 1840	NA, NT, OR, PA	Baroni Urbani, 1977b

93.	**Stereomyrmex** Emery 1901	OR	
94.	Strumigenys F.Smith 1860	AU, ET, MA, NA, NT, OR, PA	
*95.	**Tetheamyrma** Bolton, 1991	OR	
96.	Tetramorium Mayr 1855	AU, ET, MA, NA, NT, OR, PA	Bolton, 1977
	Trichomyrmex Mayr 1865	=Monomorium	
*97.	Trichoscapa Emery 1869	ET, na, nt, OR, PA	Bolton, 1983
98.	**Tricytarus** Donisthorpe 1947	OR	
	Triglyphothrix Forel 1890	=Tetramorium	
99.	**Trigonogaster** Forel 1890	OR	
100.	Vollenhovia Mayr 1865	AU, ET, na, OR, PA	
*101.	Vombisidris Bolton, 1991	AU, OR	
	Wheeleriella Forel 1905	=Monomorium	
	Xiphomyrmex Forel 1887	=Tetramorium	

ANEURETINAE

102.	**Aneuretus** Emery 1892	OR	Shattuck, 1992a

DOLICHODERINAE [Shattuck (1992c) gave a generic revision]

*103.	Anonychomyrma Donisthorpe 1947	AU, OR	Shattuck, 1992c
104.	Bothriomyrmex Emery 1869	AU, OR, PA	
105.	Dolichoderus Lund 1831	AU, NA, NT, OR, PA	Shattuck, 1992c
	Hypoclinea Mayr 1855	=Dolichoderus	
	Irenea Donisthorpe 1938	=Polyrhachis (FORMICINAE)	
106.	Iridomyrmex Mayr 1862	AU, OR	Shattuck, 1992a
	Leptomyrmex Mayr 1862	→[AU]	
	Liometopum Mayr 1861	→[NA, NT, PA]	
	Monoceratoclinea Wheeler 1935	=Dolichoderus	
	Myrmapatetes Wheeler 1929	=Odontomachus (PONERINAE)	
*107.	**Loweriella** Shattuck 1992c	OR	
*108.	Ochetellus Shattuck 1992	AU, OR	Shattuck, 1992a
*109.	Philidris Shattuck 1992	AU, OR	Shattuck, 1992a
	Semonius Forel 1910	=Tapinoma	
110.	Tapinoma Foerster 1855	AU, ET, MA, NA, NT, OR, PA	

111.	Technomyrmex Mayr 1872	AU, ET, MA, OR, PA	
	Truneria Forel 1895	→ [AU]	
	Zatapinoma Wheeler 1928	=Tapinoma	
FORMICINAE			
	Acantholepis Mayr 1861	=Baroniurbania	
112.	Acropyga Roger 1862	AU, ET, NA, NT, OR, PA	
	Andragnathus Emery 1922	=Paratrechina	[Agosti & Bolton, 1990]
	Anacantholepis Santschi 1914	=Plagiolepis	
113.	Anoplolepis Santschi 1914	AU, ET, OR	
*114.	Baroniurbania Pagliano & Scaramozzino 1989	AU, ET, OR, PA	
*115.	Bregmatomyrma Wheeler 1929	OR	
*116.	Calomyrmex Emery 1895	AU, OR	
117.	Camponotus Mayr 1861	AU, ET, MA, NA, NT, OR, PA	[Subg. Colobopis is sometimes treated as genus]
118.	Cataglyphis Foerster 1850	ET, OR, PA	Agosti, 1990
	Chapmanella Wheeler 1930	=Euprenolepis	
119.	Cladomyrma Wheeler 1920	OR	Agosti, 1991
120.	Echinopla F.Smith 1857	AU, OR	
*121.	Euprenolepis Emery 1906	AU, OR	
*122.	**Forelophilus** Kutter 1931	OR	
123.	Formica Linnaeus 1758	NA, NT, OR, PA	
124.	**Gesomyrmex** Mayr 1868	OR	
	Hemioptica Roger 1962	=Polyrhachis	
125.	Lasius Fabricius 1804	NA, OR, PA	Wilson, 1955
	Mesoxena F. Smith 1860	=Echinopla	
	Myrmecocystus Wasmael 1838	→ [NA]	
126.	**Myrmoteras** Forel 1893	OR	Moffett, 1985
	Nylanderia Emery 1906	=Paratrechina	
127.	Oecophylla F.Smith 1860	AU, ET, OR	
128.	Opisthopis Emery 1893	AU, OR	
*129.	**Overbeckia** Viehmeyer 1915	OR	
130.	Paratrechina Motschulsky 1863	AU, ET, MA, NA, NT, OR, PA	Trager, 1984
131.	Plagiolepis Mayr 1861	AU, ET, MA, OR, PA	

132.	Prenolepis Mayr 1861	NA, NT, OR, PA	
	Polyergus Latreille 1804	→[NA, PA]	
133.	Polyrhachis F.Smith 1857	AU, ET, OR, PA	Hung, 1970
134.	**Pseudaphomomyrmex** Wheeler 1920	OR	
135.	Pseudolasius Emery 1886	AU, ET, OR	

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